

WHAT IS CLAIMED IS:

1. A third input device used in a mouse, comprising:
 - a wheel holder mounted on a bottom board inside said mouse;
 - 5 a roller, said roller having a closed outer side, an inner side, and a receiving open chamber in said inner side;
 - an encoding wheel mounted inside said roller and pivoted with said roller to said wheel holder, said encoding wheel having a mechanical tooth form;
 - and
 - 10 a locating plate coupled to the inner side of said roller for enabling said roller to be pivoted with said encoding wheel to said wheel holder, said locating plate holding a plurality of probes respectively disposed in contact with the tooth form of said encoding wheel and adapted to output a signal indicative of direction and amount of rotation of said encoding wheel and said roller.
- 15 2. The third input device as claimed in claim 1, wherein said roller has a center axle hole and a plurality of pins equiangularly spaced around said center axle hole for securing said encoding wheel.
3. The third input device as claimed in claim 2, wherein said encoding wheel has a center through hole and a plurality of pin holes equiangularly
20 spaced around said center through hole and respectively press-fitted onto the pins of said roller.
4. The third input device as claimed in claim 1, wherein said encoding wheel comprises a flat circular wheel body, a plurality of radial teeth equiangularly spaced around the periphery of said flat circular wheel body, and
25 a plurality of peripheral notches equiangularly spaced around the periphery of

said flat circular wheel body and equally separated from one another by said radial teeth.

5 The third input device as claimed in claim 1, wherein said locating plate comprises a partition flange disposed at an inner side thereof, two locating pins provided at two sides of said partition flange and adapted to hold said probes, an axle perpendicularly extending from the center of the inner side and adapted to pivot said encoding wheel and said roller to said wheel holder.

6. The third axis input device as claimed in claim 1, wherein said probes are respectively formed of metal spring members.

10 7. The third axis input device as claimed in claim 1, wherein said probes are respectively formed of metal conductor members.

8. The third axis input device as claimed in claim 1, wherein the number of said probes is at least 3.

15 9. A third axis input device used in a mouse, comprising:
a wheel holder mounted on a bottom board inside said mouse;
a roller, said roller having an outer closed side, and a receiving open chamber in an inner side thereof;

an encoding wheel disposed inside said receiving open chamber of said roller, said encoding wheel comprising a flat circular wheel body, a plurality of radial teeth equiangularly spaced around the periphery of said flat circular wheel body, and a plurality of peripheral notches equiangularly spaced around the periphery of said flat circular wheel body and equally separated from one another by said radial teeth;

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a locating plate coupled to the inner side of said roller to pivot said roller and said encoding wheel to said wheel holder; and

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a plurality of probes respectively mounted on one side of said locating plate, disposed in contact with the radial teeth and peripheral notches of said encoding wheel and adapted to output a signal indicative of direction and amount of rotation of said encoding wheel and said roller.

5 10. The third input device as claimed in claim 9, wherein said roller has a center axle hole and a plurality of pins equiangularly spaced around said center axle hole for securing said encoding wheel.

 11. The third input device as claimed in claim 10, wherein said encoding wheel has a center through hole and a plurality of pin holes
10 equiangularly spaced around said center through hole and respectively press-fitted onto the pins of said roller.

 12. The third input device as claimed in claim 9, wherein said locating plate comprises a partition flange disposed at an inner side thereof, two locating pins provided at two sides of said partition flange and adapted to hold said
15 probes, an axle perpendicularly extending from the center of the inner side and adapted to pivot said encoding wheel and said roller to said wheel holder.

 13. The third axis input device as claimed in claim 9, wherein said locating plate comprises a retaining flange protruding from an outer side thereof and fastened to said wheel holder.

20 14. The third axis input device as claimed in claim 9, wherein said probes are respectively formed of metal spring members.

 15. The third axis input device as claimed in claim 9, wherein said probes are metal conductor members.

 16. The third axis input device as claimed in claim 9, wherein a
25 number of said probes is at least 3.

17. A third axis input device used in a mouse, comprising:
a wheel holder mounted on a bottom board inside said mouse;
a roller, said roller having an outer closed side and a receiving open chamber in an inner side thereof;
5 at least one probe wheel, said at least one probe wheel each having a plurality of probes; and
a locating plate coupled to the inner side of said roller to pivot said roller and said at least one probe wheel to said wheel holder, said locating plate holding a fixed encoding wheel in contact with the probes of said probe wheel
10 for outputting a signal indicated of the direction and amount of rotation of said roller and said at least one probe wheel relative to said wheel holder.
18. The third axis input device as claimed in claim 17, wherein said roller comprises a center axle hole, and a plurality of pins equiangularly spaced around said center axle hole and adapted to hold said at least one probe wheel.
- 15 19. The third axis input device as claimed in claim 17, wherein said probes are respectively formed integral with said at least one probe wheel.
20. The third axis input device as claimed in claim 17, wherein a number of probes of each said probe wheel is at least 3.
21. The third axis input device as claimed in claim 17, wherein said
20 encoding wheel comprises a common contact portion, a conducting portion, and an electrically insulative portion respectively disposed in contact with the probes of each said probe wheel.
22. The third axis input device as claimed in claim 17, wherein said encoding wheel is formed of a circuit board and a cover plate.